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ABSTRACT

The current uniform content of college reading programs can be expanded to include insights from other disciplines, specifically those areas of instruction which pertain to the neuropsychological mechanisms governing behavior, especially language behavior. There are several reasons for expanding the boundaries of college reading programs to include a neuropsychological perspective: (1) a reading program incorporating this added dimension provides students with a view of reading instruction different from what they perceive it to be; (2) students are able to bring prior experiences to substantiate classroom instruction; (3) teachers can point out the interconnections among disciplines; and (4) students engage in discussion beyond the allotted time for classroom instruction on issues raised. Memory, sensation/perception, and vision are three areas of instruction that could be added to existing college reading programs. A series of simple classroom activities involving memory, sensation/perception, and vision can add dimension to college reading programs and provide insights into reading instruction and into activities of students' daily lives. Ninety students enrolled in three sections of a college reading course incorporating neuropsychology left the course with the impression that reading was more than mastery of new or unfamiliar words or the ability to recast an author's message. Instead, the students saw reading as a combination of theoretical issues and their application to everyday academic and personal experiences. (Twenty-seven references are attached.) (RS)

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EXTENDING THE BOUNDARIES OF COLLEGE READING PROGRAMS

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ABSTRACT

College reading programs appear to be uniform in course content. Without minimizing the content of these programs, this paper attempts to expand the offering of reading courses by incorporating insights from neuropsychology. Specifically, instructional units such as memory, vision, sensation/perception could be added to existing college reading programs. Building on previous reading theory, students' experience, and working with teachers in other disciplines, these factors would be reasons for expanding the domain of college reading programs.

EXTENDING THE BOUNDARIES OF COLLEGE READING PROGRAMS

Looking through the course offerings of several college reading programs, one finds an almost uniformity of courses. Included are such instructional units as techniques for effective reading, comprehension skills, notetaking skills, examination preparation, vocabulary development, and students' learning styles (Aron, 1978; Chaplin, 1977; Dillard, 1989; McCarthy, 1980; Roueche and Snow, 1977; Smith, 1982). Uniformity of comprehension skills, for instance, is carried out by emphasizing reading for main ideas, identifying supporting information, evoking inferences, and relating the material to real-life issues.

This uniformity of program offerings might have come about based on reading instructors' perceptions of students' needs. This writer contends that the content of college reading programs can be expanded toother academic disciplines, specifically those areas of instruction which pertain to the neuropsychological mechanisms governing behavior, especially language behavior.

Rationale

There are several reasons for expanding the boundaries of college reading programs to include a neuropsychological perspective.

First, a reading program which incorporates this added dimension serves as a way to provide students with a different view of reading instruction from what they perceive it to be. From my experience, and from discussions with other teachers, students enrolled in college reading classes frequently view such classes as a repetition of similar courses taught in high school or as an indication that they are not proficient

readers, based on low reading scores received on placement tests. Thus, another approach to college reading programs (i.e., course content) should create a renewed response on the part of those students to view reading instruction differently.

Second, I observe that students are able to bring prior experiences to substantiate classroom instruction. For example, in adding the topic of sight to this proposed college reading program, a teacher can generate a disucssion about the visual pathway and the primary physiological properties of sight (e.g., cornea, iris, lens, pupil, retina). Teachers can entertain a discussion on such issues as weakness or loss of vision in one eye, reasons for vision tests, blurred or double vision, tired eyes and so on. Students are usually willing to share these experiences with others, and a reading classroom becomes germane to the students' experiences when they see a relationship with classroom instruction and events in daily life (Langer, 1984; Macklin, 1978).

It should be noted that this approach to college reading programs is unlike the idea of reading across the curriculum. Where the latter focusses on having students apply reading skills to other disciplines, an extension of college reading programs aims to increase the students' knowledge about other topics not thought to be related to reading. For example, asking an athlete on the sideline who suffers a head trauma to recite the day and date of the game may not appear to be a reading activity. However, the former task assesses the athlete's ability to search and to produce stored material. These factors are related to reading.

Third, by extending the boundaries of college reading programs, teachers can point out the interconnection among disciplines. For instance, instructors and researchers can show that reading instruction draws from such subjects as biology, linguistics, philosophy and psychology. Instructors can make the case that current reading instruction - schema and metacognition - are based on insights from cognitive psychology and from linguistics (Durkin, 1978-79; Labov, 1972; Lenneberg, 1967; Luvaas-Briggs, 1984; Rumelhart, 1981; Smith, 1971 and 1978). Of course, this methodology is advocated and practiced in some instructional reading programs. However, what I am suggesting is that such insights obtained from other disciplines be included in existing reading programs.

Regarding memory, for example, students ask for suggestions to improve their memory or seek an example for their inability to recall information.

Fourth, and this position is based on my classroom experience, students engage in discussion beyond the allotted time for classroom instruction on issues raised with this added feature of reading instruction. Students frequently bring topics to class on the need for prescription glasses, for example, when I duscuss the method of seeing objects and words on a page. These discussions suggest that students are thinking about reading beyond the skills acquisition method usually taught in class.

Let me be clear on this point. I am not introducing an entirely new syllabus to college reading programs. In my syllabus, for example, I include such topics as textbook comprehension, test-taking skills,

improved rate of reading and vocabulary instruction. These are established instructional units in college reading programs and can be justified by educators. What I am advocating, however, are added features to college reading programs, especially features which are obtained from on-going advances in the area of cognitive science from which much of reading theory evolves.

This expanded course could be the first of two or three courses offered in a reading program. Other reading topics could draw from ideas developed in this expanded course. For example, an instructional unit on improving students' rate of reading would include information about peripheral vision, subvocalization, fixation, and line recovery. These issues are part of the physiology of reading.

AREAS OF INSTRUCTION

Three areas of instruction which could be expanded to existing college reading programs are memory, sensation/perception, and vision. For each instructional unit, I present a theoretical perspective; in addition, I offer an account of how I carry out that unit in my class.

Memory

Memory is a central feature of learning and of our everyday activities. Sometimes we take it for granted since our activities appear routine. Our daily preparation for work is almost a subconscious act. However, a very large portion of getting ready for work, for instance, depends on memory. Likewise, anyone who tries to perform certain mathematical computations, without the use of a calculator, must remember the rules for carrying out certain substeps in the process. Fractions

and decimals come to mind.

One instructional practice that I use with a reading class of thirty students is to have them work with numbers in order to demonstrate instances of short-term memory. An example of this practice is as follows:

(1) Write a series of seven numbers from 1-20 in random order;

(2) Show the list for approximately 7-10 seconds to your classmate seated next to you;

(3) Select one of those numbers and write it on the back of the page;

(4) Without exposing the previous list, ask your classmate if that number was one that he/she saw on the initial list of numbers;

(5) Further, ask your classmate where in the sequence of the initial numbers (e.g., first, second) did that specific number appear.

This classroom activity is an enjoyable task. Also, it points out the notion of short-term memory. I make a distinction between short-term and long-term memory since individuals use them for specific purposes. For example, some reading assignments insist that readers pay attention to the immediate; others, on the contrary, require that individuals store the information for future reference.

I make the point regarding memory, and the improvement of memory, as a focal part of learning and of the university experience. For example, I remind students that they are required to memorize cellular structure in biology, theories in social psychology, names and events in history, formulas in chemistry and mathematics and so on. I stress the

point that memory can be improved with a conscious attempt to store and to recall the material.

As a further demonstration of memory, I devise a test to measure recall and recognition skills. In the former task, the answer is right or wrong. For example, who was the president before President Reagan? In a recognition task, one looks for an approximation of the answer. For example, when was Reverend Jesse Jackson's last visit to the campus? Obviously, the answer would range from the year, the month, or the actual day of the month of his visit.

In an expanded version of college reading programs, the inclusion of memory is not to suggest that this unit of instruction is not contained or practiced in current reading instruction. Rather, it is to show the broad features of memory beyond classroom practice. For example, to make the point more forcefully, I ask students to explain why their grandmother would have difficulty remembering their names after they have been away at the university for a semester. This question allows students to bring together the issues discussed in class and to apply them to their daily lives which bear on memory (e.g., aging, cellular loss, medication, lack of event rehearsal).

Furthermore, there is a neurophysiological basis to memory. Whether it is drug induced (e.g., physostigmine), the ravages of senile dementia (E.g., Alzheimers) with aging parents, or trauma to the head (e.g., athletes immobilized from a blow to the head), students can relate to specific features of memory in the academic, as well as in the domestic world (Squire, 1982). This information would partly explain the failing memory of an elderly individual and would be included in a unit on memory of the reading syllabus.

Sensation/Perception

In addition to memory, a college reading program could expand into an area such as sensation/perception (Coren et al, 1984). Neurophysiologically, sensation is the neural input to the brain. Hearing a horn is sensation. Neuropsychologically, perception is what the brain does with the stimulus. If one waves, or jumps out of the way, these actions depend on the sense that the brain makes of the stimulus.

The following instructional practice in sensation/perception is used to show how this mechanism functions. Here are the instructions to students:

(1) Reach out for the hand of the person sitting next to you;

(2) Use the cover of your pen, a paper clip or a dull instrument and write a number or a letter on the back of his/her hand; and

(3) Ask the recipient what was written on his/her hand.

The students take turns with this activity.

I, then, explain to the students that the correct answer is possible because the brain stores the answer and that the touch which travels up the spinal cord conveys the stimulus to the brain (Levinthal, 1990). This procedure, known as graphesthesia is a neurological examination, is a diagnostic tool for assessing both spinal cord and cognitive deficits.

The point to be made is that the ability to pronounce or to identify vocabulary items, for example, is based on similar principles of storage and visual stimuli (Smith, 1978). If a reader has stored a word, as is the case with a graphesthesia test for numbers, then the sensation experienced in seeing the word is used to activate the item in visual storage. As a

result, word meaning and pronunciation are easily accomplished if there is an immediate correspondence between sensation/perception and word storage in the brain. Conversely, the inability to master words, either in pronunciation or in meaning, is linked to the students' inability to obtain that word from storage through a faulty sensation/perception mechanism (Smith, 1978). Word storage, in so far as research attempts to show, is in the temporal lobe, sometimes called Wernicke's area (Ornstein, 1985). The information is matched with what is already existent in the brain. As a matter of fact, the process of touch sensation governs reading in braille (Margulies, 1986).

Vision

In addition to memory, sensation/perception, we can expand college reading programs to include vision (Marzano, 1978). This unit of instruction involves the visual pathway and the general principles that contribute to vision, especially those involved in reading a textbook (Levinthal, 1990; Ornstein, 1985). As a matter of fact, Spache (1976) argues forcefully for incorporating vision and visual perception tests as a part of assessing students' reading abilities, especially at the elementary level.

After introducing them to some of the basic physiological components of vision (e.g., cornea, pupil, lens, retina, optic nerve, optic tract and occipital lobe), I introduce the concepts of peripheral and macular vision.

By peripheral vision is meant the ability for an individual to see objects in the lateral visual field. By macular vision is meant the point on the eyes' retina where the ability to see objects is most acute.

In the following figure, these two features of vision are demonstrated:

8 1 2 X 4 5 6

With the numbers above, peripheral vision allows the reader to see all elements with equal visibility (Foss and Hakes, 1978). However, if we focus on only the circled X above, the numbers to the left and to the right of the X are blurred. This phenomenon is due to use of macular vision. Notice a similar principle occurs when one views spectators in the stands at sport events. Our peripheral vision allows us to see all the spectators. However, to find a friend, for example, in the crowd, one has to use macular vision. As a result, we filter out the other spectators in the stands if we are to find a specific individual.

Similarly, a reader uses peripheral vision in examining a full page of textual material. Supporting data such as charts, maps, graphs, and tables lend themselves to peripheral vision. As a fun-related activity, I ask students to test each other for visual fields with a finder identification task which physicians usually employ.

Macular vision is the capacity to view letters or objects unmindful of other visual stimuli that may be present. The macular is the central spot on the retina where images are focussed. We use this type of vision to verify the spelling of a word(s), to isolate vocabulary words which may be difficult to pronounce and to syllabicate unfamiliar words. For example, when we want to know if the word "committee" has one or two m's, our vision focuses on the area where the letter m is, while the other letters to the right and to the left of the m are fairly visible. Again, this view of reading is supported from neuropsychological insights on vision and on perception (Ornstein, 1985), and students are able to

tie reading theory with facets of daily life.

EVALUATION

In the absence of experimental data to support this expanded practice of college reading programs (i.e., the inclusion of memory, sensation/perception, and vision), some anecdotal evidence offered by students suggests that there is a place for an expanded version of college reading programs. Among the students' comments noted during and at the end of the course were the following:

> "I didn't know that reading was like that with all that stuff."
>
> "That topic on memory came up in my psychology class."
>
> "I told my roommate that she probably needs glasses from what we discussed about sight."
>
> "I notice that when a football player gets hurt, the doctor holds up fingers for the player to count. Why does the doctor do that?"
>
> "Why do I forget things for a few minutes and then they come back?"

Student involvement during and at the end of the semester was, on the whole, positive. Ninety students were enrolled in three sections of developmental reading during the semester. The added dimension to college reading programs provided students with both academic and experiental information which went beyond classroom instruction. They left the course with the impression that reading was more than mastery of new or unfamiliar words or the ability to recast an author's message, as one measure of comprehension. In my view, students saw reading as a combination of theoretical issues (e.g., schema, metacognition, summaries, paraphrase, synonymy) and their application to everyday academic and

personal experiences.

This writer does not intend to convert reading teachers to neuro-psychologists. What is suggested is that an expansion of reading courses to other disciplines would lend insights to reading instruction and to activities of students' daily lives. (Anderson, 1985; Pinel, 1990; Stillings et al, 1987) have maintained that reading instruction does not exist by itself. It draws from other disciplines. In drawing from other disciplines, I am extending the horizons of college reading programs to embrace other academic disciplines and to examine their contribution to reading theory and practice.

Traditionally, instructors argue for reading across the curriculum. Another approach is to extend the content of college reading programs to embrace other academic disciplines in so far as the latter contributes to an understanding of reading theory, reading instruction, and events in students' lives.

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